Information Requested regarding the Belews Creek Steam Station and Marshall Steam Station Bottom Ash Sampling Data Provided in Comments

1. What selection criteria did Duke Energy use to identify Belews Creek and Marshall Steam Station as plants to sample? Are there any other bottom ash data associated with other Duke plants? EPA requests that bottom ash sampling data be provided for all Duke Energy plants for which data are available.

Response:
We selected Belews Creek and Marshall due to the close proximity of the stations to our in-house sampling personnel. Belews Creek and Marshall were also selected because we knew the plants would be operating and, thus, generating bottom ash sluice water. Also, we were able to determine that we could safely access the bottom ash sluice water discharge pipe.

Additional bottom ash data has been collected for the East Bend Steam Station. Responses to the questions are provided in the document "Additional Bottom Ash Data: East Bend".

In addition, bottom ash sulfide samples were collected at Cliffside and Cayuga. These samples were provided to UWAG for analysis. Duke Energy does not have the UWAG laboratory reports, but these reports are available through UWAG. Duke Energy did collect a split sample from Cliffside and the analytical report is included in this submission. Refer to "Cliffside Bottom Ash Lab Report 6_28_13" and "Cliffside EDD 6_28_13."

Bottom ash samples were collected from Miami Fort 6 and 8 as part of testing of additives for compliance with pending air regulations. This data is being claimed Confidential Business Information (CBI) and is being provided in the folder labeled "MFS Bottom Ash".

EPA did not specifically request responses to the questions for additional bottom ash data. Given the timeframe of the information request, responses to these questions for Cliffside or Miami Fort were not completed.

Bottom ash data from Cayuga and Gibson were collected at the request of legal counsel during fuel additive testing and is not being produced.

2. Please provide the Pond/ Impoundment Unit ID (e.g., SPD-2) for the pond which bottom ash transport water sampled would enter. Please provide the dimensions for this pond including surface area, depth, and residence time. Also, please identify what other wastestreams flow into this impoundment and their relative contributions.

Response:
Refer to the ICR Questionnaire, Question D4-2

Station	Pond Impoundment Unit ID	Surface Area (ft^2)	Depth (ft)	Residence Time (hrs)
Belews Creek	SPD-2	14,897,520	36.5	96
Marshall	Pond 1	6,664,680	35.5	96

Belews Creek (refer to the ICR Questionnaire, Question D3-2)

Wastestream	Flow
Bottom ash sluice water	3,520,800 gpd / 295 dpy
Fly ash sluice water	230,400 gpd / 20 dpy
Treated FGD wastewater	700,000 gpd / 365 dpy
Landfill leachate	10,000 gpd / 365 dpy
Boiler fireside cleaning water	83,000 gpd / 3 dpy
Coal pile runoff	128181 gpd / 124 dpy
Air heater cleaning water	664,000 gpd / 3 dpy
Reverse osmosis reject water	150 gpm ; 24 hpd / 365 dpy
Ion exchange wastewater	340,000 gpd / 9 dpy
Floor Drain wastewater	unknown

Marshall (refer to the ICR Questionnaire, Question D3-2)

Wastestream	Flow
Bottom ash sluice water	3,020,000 gpd / 365 dpy
Fly ash sluice water	9,888,000 gpd / 2 dpy
Treated FGD wastewater	1,308,000 gpd / 365 dpy
Mill Reject Sluice Water	131,000 gpd / 365 dpy
Boiler blowdown	2,000 gpd / 365 dpy
Coal pile runoff	162,134 gpd / 129 dpy
Filter backwash	7,000 gpd / 365 dpy
Reverse osmosis reject water	194,000 gpd / 365 dpy
Ion exchange wastewater	20,000 gpd / 56 dpy
Clarifier sludge	8,000 gpd / 365 dpy
Once-through cooling water	80,000 gpd / 365 dpy
Limestone pile runoff	2,000 gpd / 129 dpy
Gypsum pile runoff	5,000 gpd / 129 dpy
Boiler fireside cleaning	77,925 gpd / 4 dpy
Air heater cleaning water	326,000 gpd / 3 dpy
Track hopper sump	70,000 gpd / 365 dpy
Landfill runoff (FGD residue landfill)	5,000 gpd / 365 dpy
Sanitary	7,000 gpd / 365 dpy
Stormwater	8,330,000 gpd / 129 dpy
Floor Drain wastewater	unknown

3. For each plant, identify what chemicals are added to the wastestream upstream of the sample location or to the sample during settling.

Response:

Station	Chemicals Added
Belews Creek	No chemicals added
Marshall	No chemicals added

4. Please provide a more detailed description of the sampling method beyond "collected in accordance with Method 1669." Please specify the location of the bottom ash transport water sample provided (e.g., directly from bottom ash sluice pipe discharge into commingled pond or upstream prior to this point). Please specify whether the sample was a grab or composite sample. Additionally, provide duration and frequency information for all composite sampling (e.g., 24-hour composite collected every hour).

Response:
Refer to the document titled "UWAG Bottom Ash Sampling Protocol".

Both samples were composite samples collected from the discharge pipe prior to comingling with other waste streams.

5. How often is the bottom ash sluiced at the plant? Please indicate whether samples were collected during periods when the bottom ash is not sluiced (i.e., source water is flowing through the pipe).

Response:
All samples were collected while bottom ash sluice water was being discharged.

Refer to the ICR Questionnaire, Question C3-3

Plant	Unit	Average Sluice Water Flow Rate (gpd)	Typical Duration (hpd)	Typical Frequency (dpy)
Belews Creek	1	880,200	6	262
Belews Creek	2	880,200	6	285
Marshall	1	1,832,400	5	267
Marshall	2	1,832,400	5	240
Marshall	3	900,000	6	336
Marshall	4	900,000	6	332

6. Please identify how long the bottom ash was in contact with the water prior to collecting the supernatant. How does this sample settling time compare to the retention time of the surface impoundment identified in question #2?

Response:

Belews Creek: The water was in contact with the bottom ash approximately 6 hours prior to collecting the supernatant. The bottom ash sample was collected in the field in the carboy and transported back to the laboratory to collect the supernatant.

Marshall: The water was in contact with the bottom ash approximately 3 hours prior to collecting the supernatant. The bottom ash sample was collected in the field in the carboy and transported back to the laboratory to collect the supernatant.

7. For each plant, please provide additional details regarding the source water sampling locations:

a. Please specify the location of the source water samples provided. Please indicate whether the plant discharge is upstream or downstream of intake water location (i.e., does any of the plant's effluent contribute to intake water)?

Response:

Plant	Source Water Sample Location	Plant Discharge
Belews Creek	Tap @ the service water intake	Intake water is from Belews Lake. The ash pond discharges to the Dan River downstream of Belews Lake.
Marshall	Tap @ the service water intake	Discharge and intake are both on Lake Norman. The discharge is to the surface water whereas; the service water intake is located at a depth of approximately 30 feet below the surface water elevation.

b. Does the plant treat the intake water prior to use in the bottom ash sluicing system. If so, how is the intake water treated?

Response:

Plant	Bottom Ash Sluice Water Treatment
Belews Creek	No treatment
Marshall	No treatment

c. Does the plant recycle any process wastewater for use in the bottom ash sluicing system. If so, how?

Response:

Plant	Plant Recycle Water
Belews Creek	No
Marshal	No

8. For each plant, please provide the associated TSS concentration for the source water and the bottom ash samples.

Response:

Plant	TSS Concentration
Belews Creek	Sample was not analyzed for TSS.

Marshall	Sample was not analyzed for TSS.

9. For each plant, describe any atypical operations occurring at the plant at the time of sampling (e.g., test burn of new coal).

Response:

Plant	Operations
Belews Creek	Normal operation.
Marshall	Normal operation

10. For each plant, please provide the flow rate of the wastewater at the time of sampling, as well as the average annual bottom ash discharge flow rate.

Response:
See response for Question 5 above regarding the average annual bottom ash discharge flow rate.

The flow rate was not recorded at the time of sampling.